



Flat Panel TV Cost Analysis & Panel Supply-Demand

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DisplaySearch

2008 DisplaySearch China HDTV Conference
Guangzhou Shangri-La Hotel, 2008.5.20-21



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- Referenced and related DisplaySearch research:
 - [Quarterly TV Cost and Price Forecast Model](#)

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World's Biggest Retailer Walmart Refreshes In-Store Digital Signage

September 22nd, 2008

By Chris Connerly, Vice President, PC and Large Format Commercial Displays and David Hsieh, Vice President, Greater China Market

The world's biggest retailer Walmart is on the minds of many in the FPD industry as it continues to grow as a major outlet for FPD TVs as well as other consumer electronics products. Equally important is how it goes about merchandising these products. In an announcement (finally) made earlier last week, Walmart announced a refresh to its in-store digital signage network now dubbed Walmart Smart Network. Walmart is often stated by many to be the US's fifth largest TV network (behind NBC, ABC, CBS and FOX) due to the foot traffic of Walmart with "120-130 million viewers a month" often mentioned. This upgrade to the existing Walmart TV requires new Digital Signage displays, which is great news for the industry.

The roll-out was publicly stated to include 27,000 Public Display/Digital Signage solutions over a two-year period. The integrator is the US's largest provider of Digital Signage, Thompson's PRN (Premier Retail Networks <http://www.prn.com/>) which has recently struck a deal with display provider Planar.

Figure 1 Examples of PRN's Current Solutions for Walmart: 15", 42" and 57" LCD Displays

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Categories

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Outline

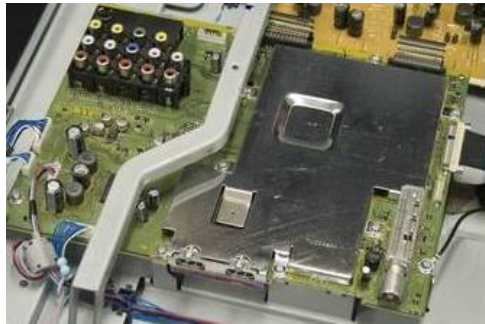
- 
- **Flat Panel TV Structure**
 - **Cost & Forecast ...LCD TV, PDP TV, OLED TV**
 - **LCD TV Panel Supply-Demand**

LCD TV Anatomy

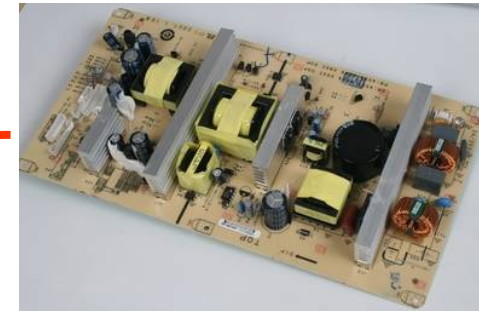
TFT LCD Panel



E/E (Electronic Engineering)



Power Unit



Tuner Video Processor



DRAM



PCB



Audio Processor

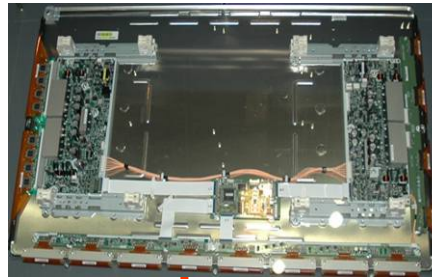


M/E (Mechanical Engineering)



PDP TV Anatomy

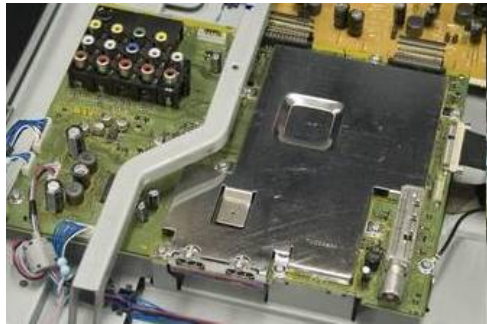
Plasma Panel



Front Filter



E/E (Electronic Engineering)



Power Supply



M/E (Mechanical Engineering)



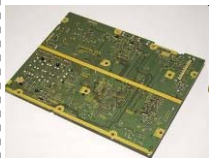
Tuner Image Processor



DRAM



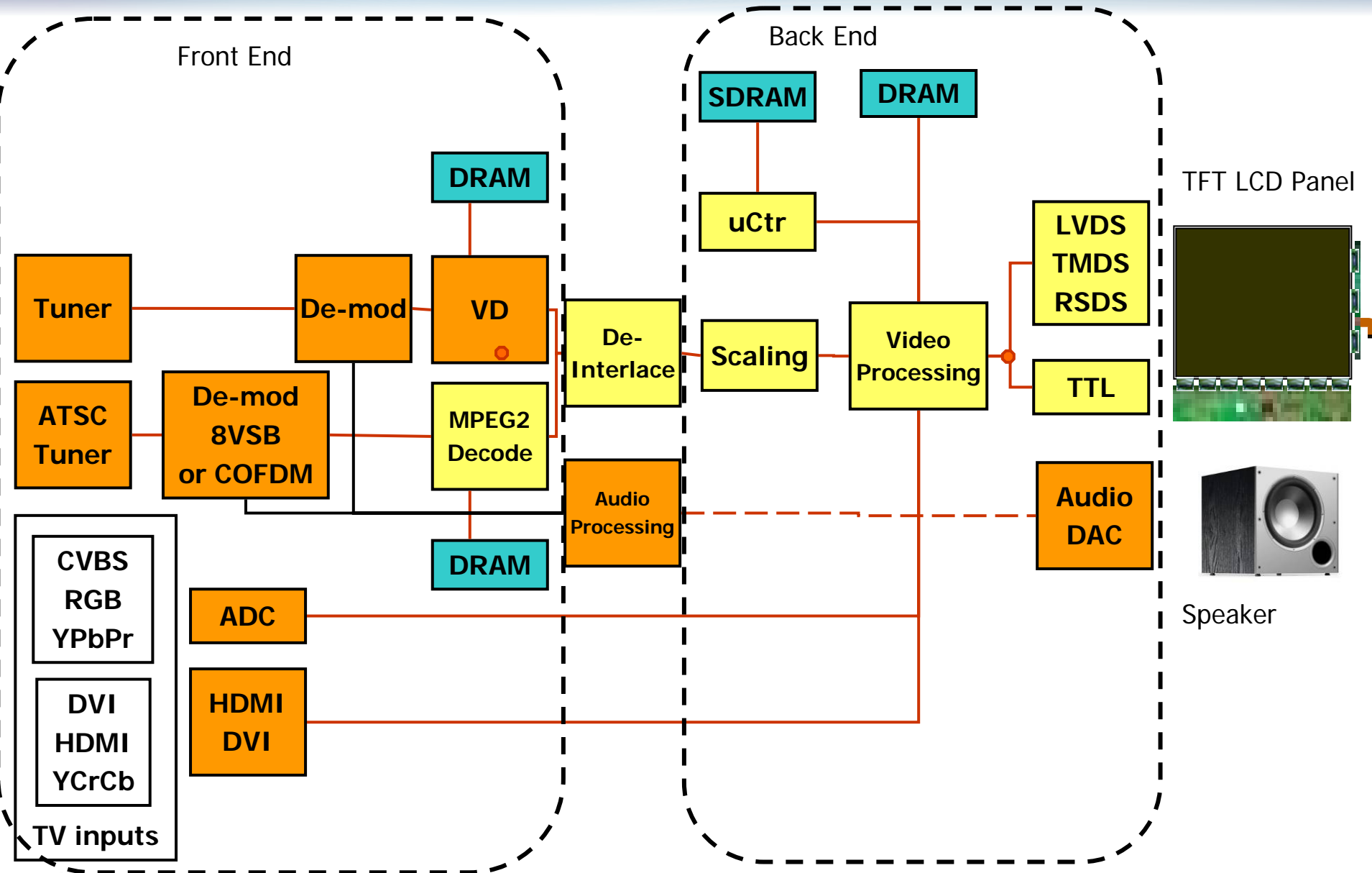
PCB



Audio Processor



E/E --- Integrated Digital TV (iDTV) System Diagram



M/E --- Frame Mold

Front Cover



Back Cover



Stand



Remote Control



Outline

- Flat Panel TV Structure
- Cost & Forecast ...LCD TV, PDP TV
- LCD TV Panel Supply-Demand



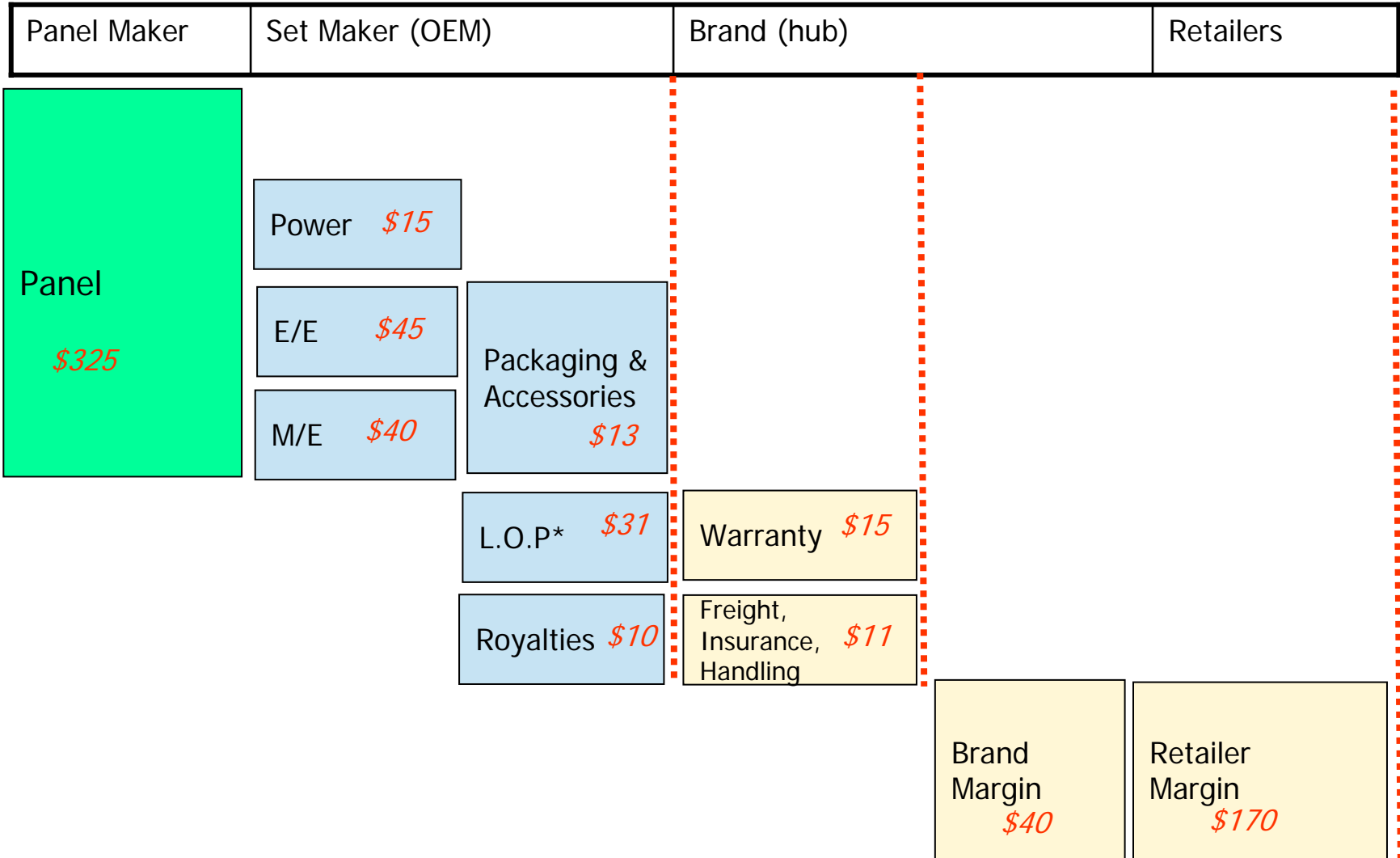
Flat Panel TV Price & Cost Structure

Example : 32" HD LCD TV

FOB
\$479

ex-Hub
\$505

Street
\$715

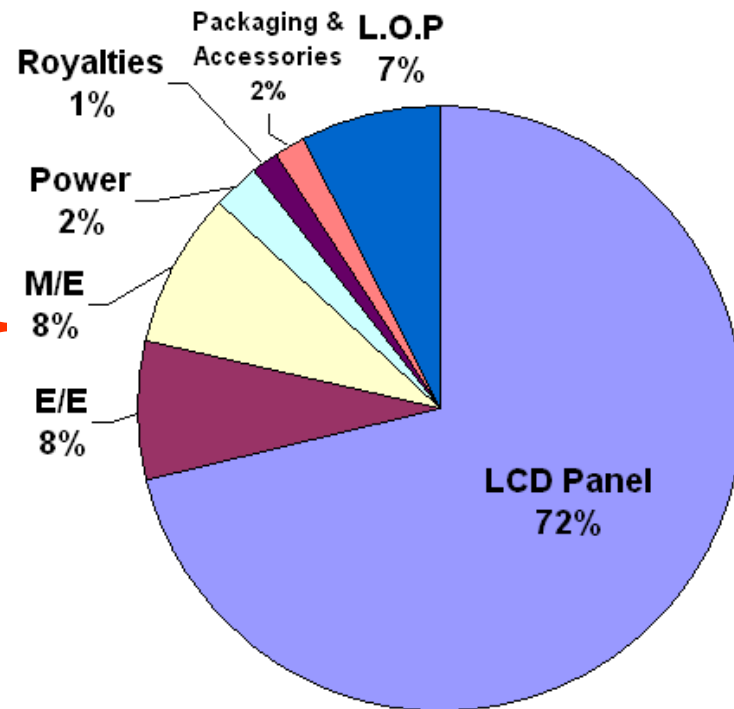


*L.O.P = Labor, Overhead & Profit

LCD TV Manufacturing Cost Structure

Model
42" 1920 x 1080

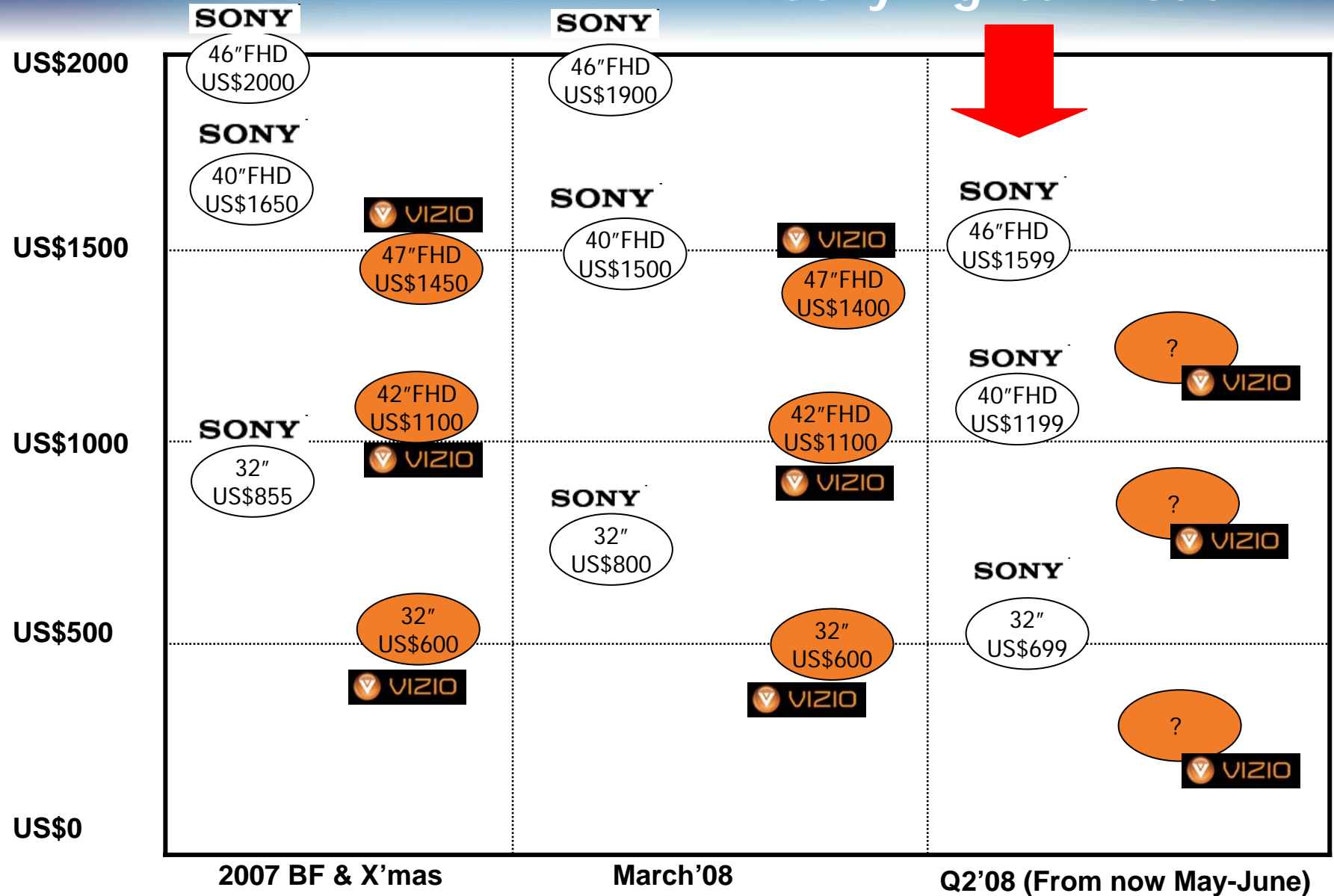
	Q2'08
LCD Module Price in Previous Quarter	\$579.38
Inverter	\$0.00
NTSC_Tuner	\$0.00
ATSC_Tuner_Demod	\$5.40
Image_Processing	\$21.32
Audio_Processing	\$7.10
Power	\$19.90
Other_Electronics	\$27.43
PCB_Mechanical	\$4.99
Other_Mechanical	\$64.07
Packaging&Accessories	\$15.31
Royalties	\$10.00
Labor + Overhead + Profit	\$60.39
Warranty for 12-18 Months	\$25.22
USA Import Duty	\$0.00
Freight to USA	\$6.39
Insurance	\$3.39
Handling & Surface	\$5.95
Ex-Hub	\$856.24
Brand Margin (%)	10%
Reseller Margin (%)	24%
Average Street Price	\$1,251.81



In case of USA market, brand margin is 10%~15%,
National Channel margin is 20%-30%
Warehouse Club margin is 10%~15%

Such as "Fighter Model" !

Sony Fighter Model



Remark : The Sony fighter model price is based on DisplaySearch MAP tracking.

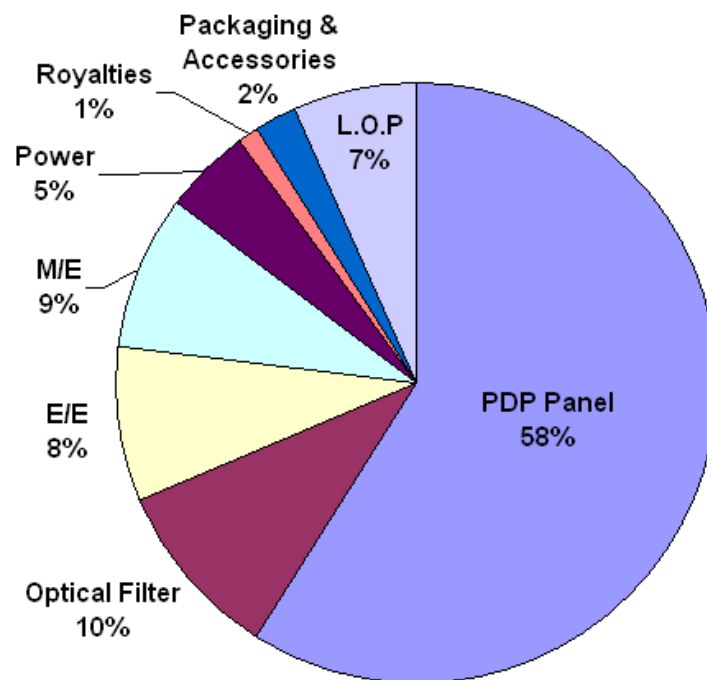
Source: The 2007 and March'08 price is based on The NPD Group / Retail Tracking Service

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PDP TV Manufacturing Cost Structure

Model
50" HD

	Q2'08
PDP Price in Previous Quarter	\$525.00
OpticalFilter	\$86.54
NTSC_Tuner	\$0.00
ATSC_TunerDemod	\$5.40
ImageProcessing	\$16.14
AudioProcessing	\$8.60
PowerSupply	\$41.78
OtherElectronics	\$41.90
OtherMechanical	\$76.05
Packaging&Accessories	\$20.20
Royalties	\$10.00
Labor + Overhead + Profit	\$58.21
Warranty for 12-18 Months	\$32.27
USA Import Duty	\$0.00
Freight to USA	\$9.59
Insurance	\$1.84
Handling & Surface	\$6.45
Ex-Hub	\$939.98
Brand Margin (%)	8%
Reseller Margin (%)	23%
Average Street Price	\$1,326.90

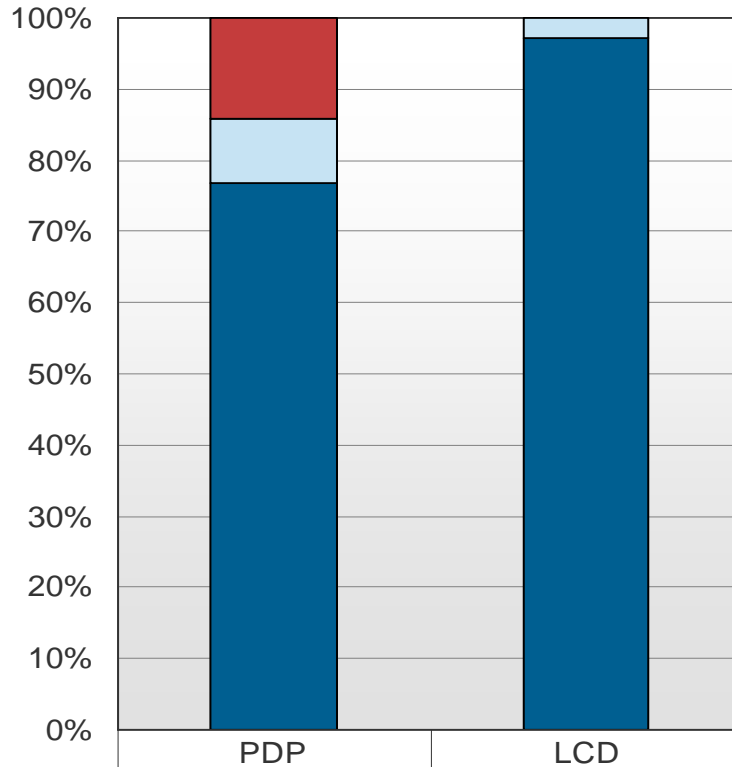


In case of USA market, brand margin is 5%~10%
 National Channel margin is 20%-30%
 Warehouse Club margin is 10%~15%

PDP and LCD "Panel + Power + Filter" Costs to TV OEMs

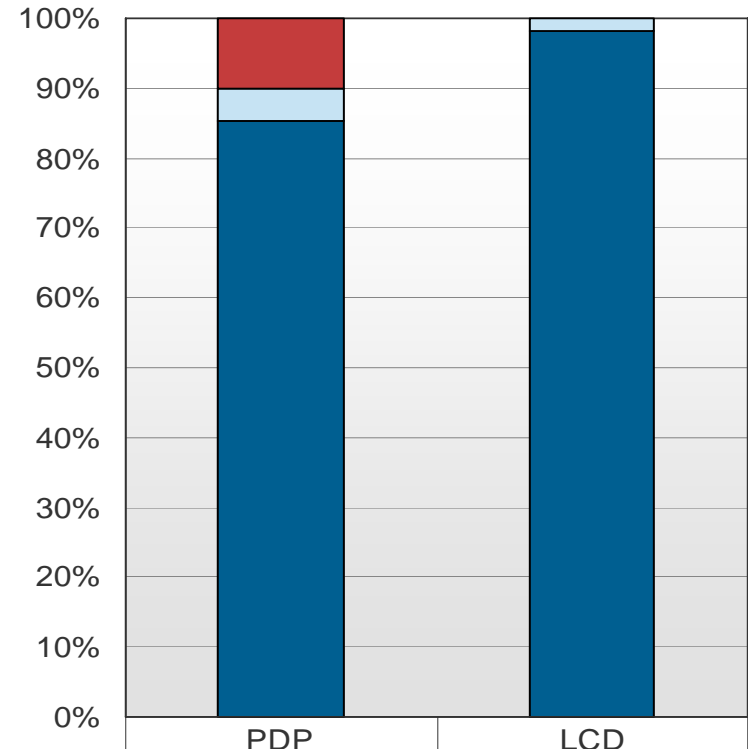
- For TV OEM companies, LCD TV is simpler to develop. And the fast integration of TV electronics chipset also helps the TV makers to approach the market fast.

42" HD



Optical Filter	14%	0%
Power Supply	9%	3%
42" HD Panel Price	77%	97%

50" 1080p



Optical Filter	10%	0%
Power Supply	5%	2%
50-52" 1080p Panel Price	85%	98%

Source: DisplaySearch's Quarterly TV Cost/Price Forecast Model and Report

TV FOB Cost Structure Comparison

- In the CRT TV, TV makers can control the majority of the FOB Cost (56%)
- But in the Flat panel TV, the display (panel) takes the major share of the FPD Cost (60%-70%)

	CRT TV	LCD TV	PDP TV	OLED TV	DLP RPTV
Display	44%	72%	58%	82%	57%
Video Process & Circuit System	34%	8%	14%	6.6%	7%
Power Supply	0.4%	2%	6%	0.6%	1%
Mechanical & Shield	10%	8%	10%	1.8%	17%
Packaging, Assembly, Royalties	12%	10%	13%	9%	17%
Total	100%	100%	100%	100%	100%

Source: DisplaySearch Q1'08 TV Cost & Forecast Report

*MD-RPTV=MicroDisplay Rear Projection TV

LCD TV v.s. PDP TV (42" HD)

■ PDP TV

	Q2'08
PDP Price in Previous Quarter	\$328.00
OpticalFilter	\$58.06
NTSC_Tuner	
ATSC_TunerDemod	\$5.40
ImageProcessing	\$16.14
AudioProcessing	\$8.60
PowerSupply	\$36.33
OtherElectronics	\$37.41
OtherMechanical	\$66.62
Packaging&Accessories	\$16.11
Royalties	\$10.00
Labor + Overhead + Profit	\$46.61
Warranty for 12-18 Months	\$22.82
USA Import Duty	
Freight to USA	\$6.46
Insurance	\$1.30
Handling & Surface	\$4.56
Ex-Hub	\$664.42

■ LCD Panel cost is higher

■ PDP's system (non-panel) cost is higher

\$255

\$159

■ LCD's L.O.P. is higher

■ Logistics cost are the same

■ LCD TV

	Q2'08
LCD Module Price in Previous Quarter	\$531.05
Inverter	
NTSC_Tuner	
ATSC_Tuner_Demod	\$5.40
Image_Processing	\$16.30
Audio_Processing	\$2.95
Power	\$19.90
Other_Electronics	\$22.44
PCB_Mechanical	\$4.99
Other_Mechanical	\$64.07
Packaging&Accessories	\$13.11
Royalties	\$10.00
Labor + Overhead + Profit	\$55.22
Warranty for 12-18 Months	\$23.05
USA Import Duty	
Freight to USA	\$6.39
Insurance	\$3.10
Handling & Surface	\$5.45
Ex-Hub	\$783.42

- The gap of panel price is about US\$100
- 42" HD PDP is more competitive than 42" HD LCD, but 42" HD market is not growing

LCD TV v.s. PDP TV (42" Full HD, 1080p)

■ PDP TV

	Q2'08
PDP Price in Previous Quarter	\$475.37
OpticalFilter	\$58.06
NTSC_Tuner	
ATSC_TunerDemod	\$5.40
ImageProcessing	\$21.02
AudioProcessing	\$8.60
PowerSupply	\$43.60
OtherElectronics	\$44.89
OtherMechanical	\$68.81
Packaging&Accessories	\$18.30
Royalties	\$10.00
Labor + Overhead + Profit	\$60.32
Warranty for 12-18 Months	\$29.54
USA Import Duty	
Freight to USA	\$6.46
Insurance	\$1.69
Handling & Surface	\$5.91
Ex-Hub	\$857.97

■ LCD Panel cost is higher

■ PDP's system (non-panel) cost is higher

\$279

\$176

■ L.O.P. is similar.

■ Logistics cost are the same

■ LCD TV

	Q2'08
LCD Module Price in Previous Quarter	\$579.38
Inverter	
NTSC_Tuner	
ATSC_Tuner_Demod	\$5.40
Image_Processing	\$21.32
Audio_Processing	\$7.10
Power	\$19.90
Other_Electronics	\$27.43
PCB_Mechanical	\$4.99
Other_Mechanical	\$64.07
Packaging&Accessories	\$15.31
Royalties	\$10.00
Labor + Overhead + Profit	\$60.39
Warranty for 12-18 Months	\$25.22
USA Import Duty	
Freight to USA	\$6.39
Insurance	\$3.39
Handling & Surface	\$5.95
Ex-Hub	\$856.24

- The gap of panel price is about US\$100
- 42" FHD PDP Cost is similar to 42" FHD LCD, consumer tend to choose LCD

LCD TV v.s. PDP TV (50"-52" Full HD, 1080p)

■ PDP TV

	Q2'08
PDP Price in Previous Quarter	\$761.00
OpticalFilter	\$86.54
NTSC_Tuner	
ATSC_TunerDemod	\$5.40
ImageProcessing	\$21.02
AudioProcessing	\$8.60
PowerSupply	\$50.14
OtherElectronics	\$45.89
OtherMechanical	\$76.74
Packaging&Accessories	\$20.20
Royalties	\$10.00
Labor + Overhead + Profit	\$86.84
Warranty for 12-18 Months	\$42.52
USA Import Duty	
Freight to USA	\$9.59
Insurance	\$2.43
Handling & Surface	\$8.50
Ex-Hub	\$1,235.41

■ LCD Panel cost is higher

■ PDP's system (non-panel) cost is higher

\$325

\$226

■ LCD's L.O.P. is higher.

■ Logistics cost is similar

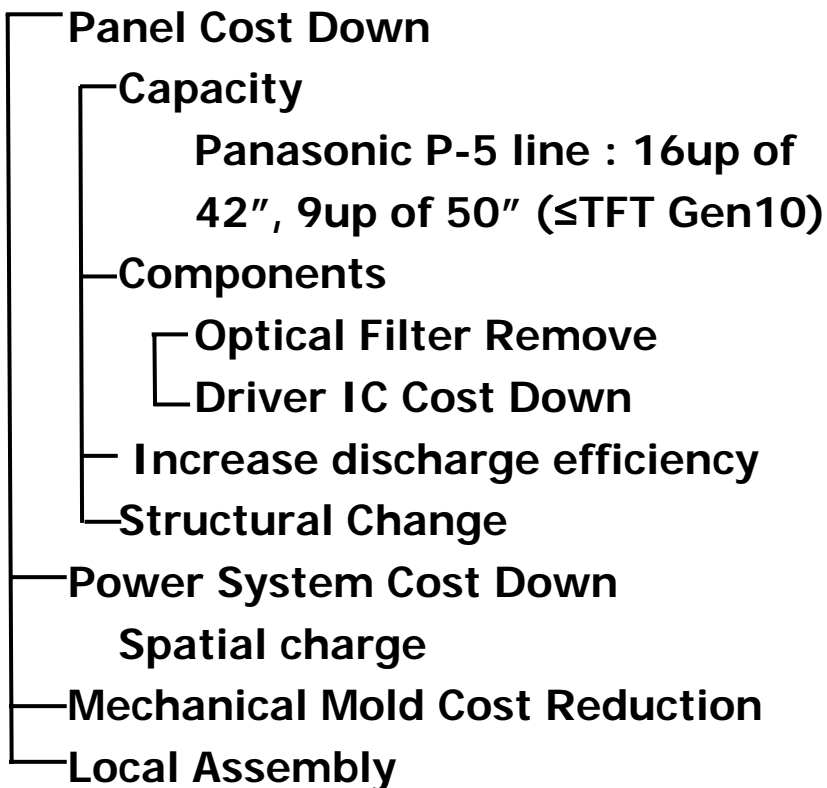
■ LCD TV

	Q2'08
LCD Module Price in Previous Quarter	\$1,176.52
Inverter	
NTSC_Tuner	
ATSC_Tuner_Demod	\$5.40
Image_Processing	\$21.32
Audio_Processing	\$10.80
Power	\$39.80
Other_Electronics	\$29.69
PCB_Mechanical	\$4.99
Other_Mechanical	\$87.13
Packaging&Accessories	\$17.21
Royalties	\$10.00
Labor + Overhead + Profit	\$112.23
Warranty for 12-18 Months	\$46.86
USA Import Duty	
Freight to USA	\$6.39
Insurance	\$6.27
Handling & Surface	\$11.02
Ex-Hub	\$1,585.63

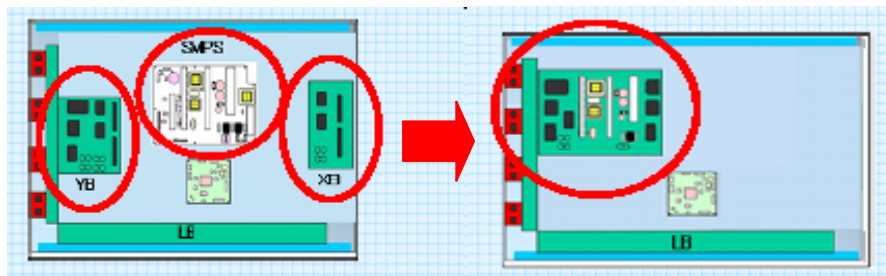
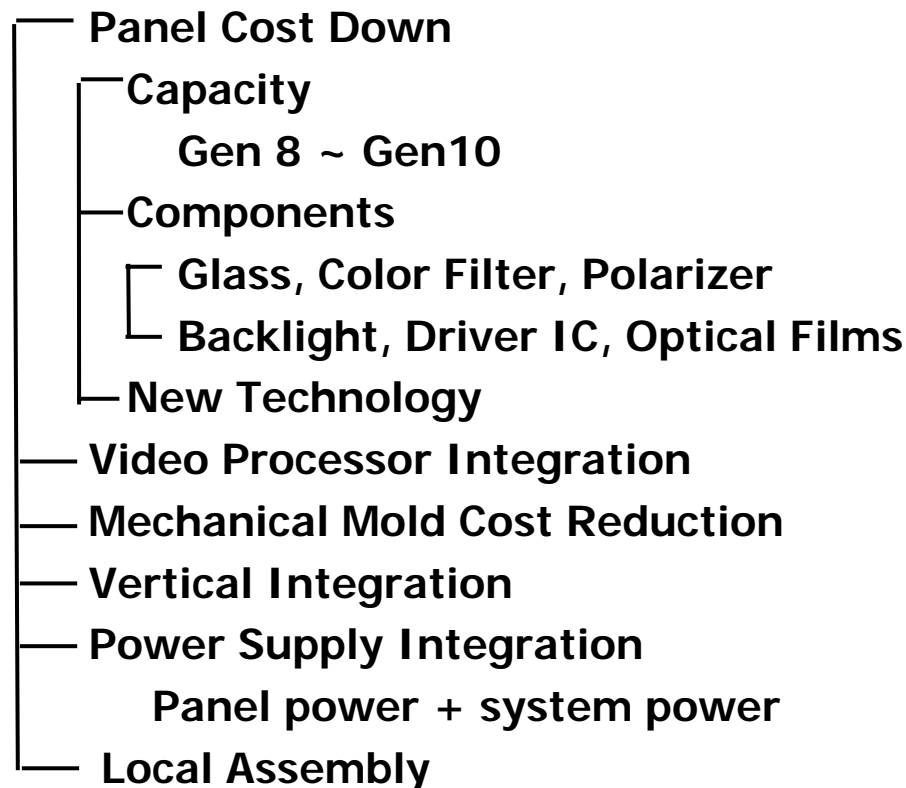
- The gap of panel price is US\$415
- 50" FHD PDP Cost is lower than 52" FHD LCD due to the panel cost gap.

Flat Panel TV Cost Down Efforts

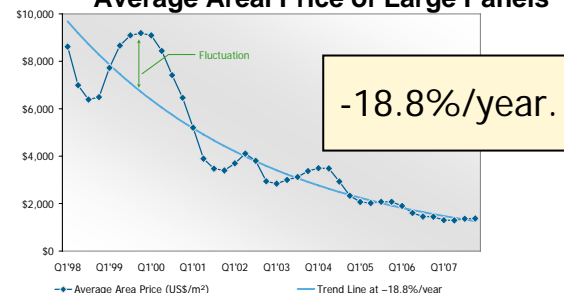
■ PDP TV



■ LCD TV



Average Areal Price of Large Panels



LCD TV and PDP TV Quarterly Cost Down Simulation

■ PDP TV

■ LCD TV

Parameter	Quarterly Decline
NTSC Tuner	1% - 3%
ATSC Tuner/Demod.	1% - 2%
Image Processing	1% - 2%
Audio Processing	0% - 4%
Power Costs	2% - 4%
Other Elec.	0% - 1%
Mechanical	0% - 1%
Packaging and Access.	0% - 1%
Royalties	0%

Parameter	Quarterly Decline
Inverter	4% - 5%
NTSC Tuner	1% - 3%
ATSC Tuner/Demod.	1% - 2%
Image Processing	0% - 5%
Audio Processing	0% - 4%
Power Costs	0% - 1%
Other Elec.	0% - 1%
PCB Mechanical	1%
Other Mechanical	0% - 2%
Packaging and Access.	0% - 1%
Royalties	0%

Source: DisplaySearch Q1'08 TV Cost & Forecast Report

LCD TV FOB Cost Forecast

- FOB = Free On Board
 - = Panel + E/E + M/E + Power + Packaging + L.O.P + Royalties
 - = Not including Warranty
 - = Not including Logistics Cost
 - = Not including brands' and channel's margin

Model	Q4'06	Q4'07	Q4'08	Q4'09	Q4'10	Q4'11	Q4'12
19" 1440 x 900	\$332.16	\$283.16	\$231.19	\$199.32	\$180.94	\$164.18	\$153.15
32" 1366 x 768	\$600.82	\$527.6	\$492.4	\$433.7	\$386.0	\$347.9	\$319.16
42" 1920 x 1080	\$1,132.63	\$906.5	\$798.0	\$693.4	\$626.9	\$567.6	\$520.93
46" 1920 x 1080	\$1,574.86	\$1,184.7	\$1,015.2	\$866.7	\$781.8	\$707.3	\$648.58
52" 1920 x 1080	\$2,197.85	\$1,719.8	\$1,386.5	\$1,124.6	\$1,003.5	\$899.4	\$821.27

Model	Q4'06	Q4'07	Q4'08	Q4'09	Q4'10	Q4'11	Q4'12
19" 1440 x 900		-15%	-18%	-14%	-9%	-9%	-7%
32" 1366 x 768		-12%	-7%	-12%	-11%	-10%	-8%
42" 1920 x 1080		-20%	-12%	-13%	-10%	-9%	-8%
46" 1920 x 1080		-25%	-14%	-15%	-10%	-10%	-8%
52" 1920 x 1080		-22%	-19%	-19%	-11%	-10%	-9%

Source: DisplaySearch Q1'08 TV Cost & Forecast Report

PDP TV FOB Cost Forecast

- FOB = Free On Board
 - = Panel + E/E + M/E + Power + Packaging + L.O.P + Royalties
 - = Not including Warranty
 - = Not including Logistics Cost
 - = Not including brands' and channel's margin

Model	Q4'06	Q4'07	Q4'08	Q4'09	Q4'10	Q4'11	Q4'12
32" ED		\$490.51	\$449.87	\$414.21	\$382.77	\$356.15	\$334.07
42"-43" HD	\$1,123.82	\$726.84	\$619.82	\$561.57	\$515.51	\$477.74	\$446.02
42" 1080p		\$947.86	\$801.09	\$710.57	\$638.96	\$580.15	\$531.77
46" 1080p		\$0.00	\$954.06	\$849.23	\$748.88	\$669.37	\$612.68
50" 1080p	\$2,138.37	\$1,433.61	\$1,124.93	\$961.73	\$834.73	\$732.12	\$672.32
60"-65" 1080p	\$3,952.25	\$2,510.49	\$2,081.18	\$1,732.18	\$1,400.92	\$1,153.01	\$1,045.87

Model	Q4'06	Q4'07	Q4'08	Q4'09	Q4'10	Q4'11	Q4'12
32" ED			-8%	-8%	-8%	-7%	-6%
42"-43" HD		-35%	-15%	-9%	-8%	-7%	-7%
42" 1080p			-15%	-11%	-10%	-9%	-8%
46" 1080p				-11%	-12%	-11%	-8%
50" 1080p		-33%	-22%	-15%	-13%	-12%	-8%
60"-65" 1080p		-36%	-17%	-17%	-19%	-18%	-9%

Source: DisplaySearch Q1'08 TV Cost & Forecast Report

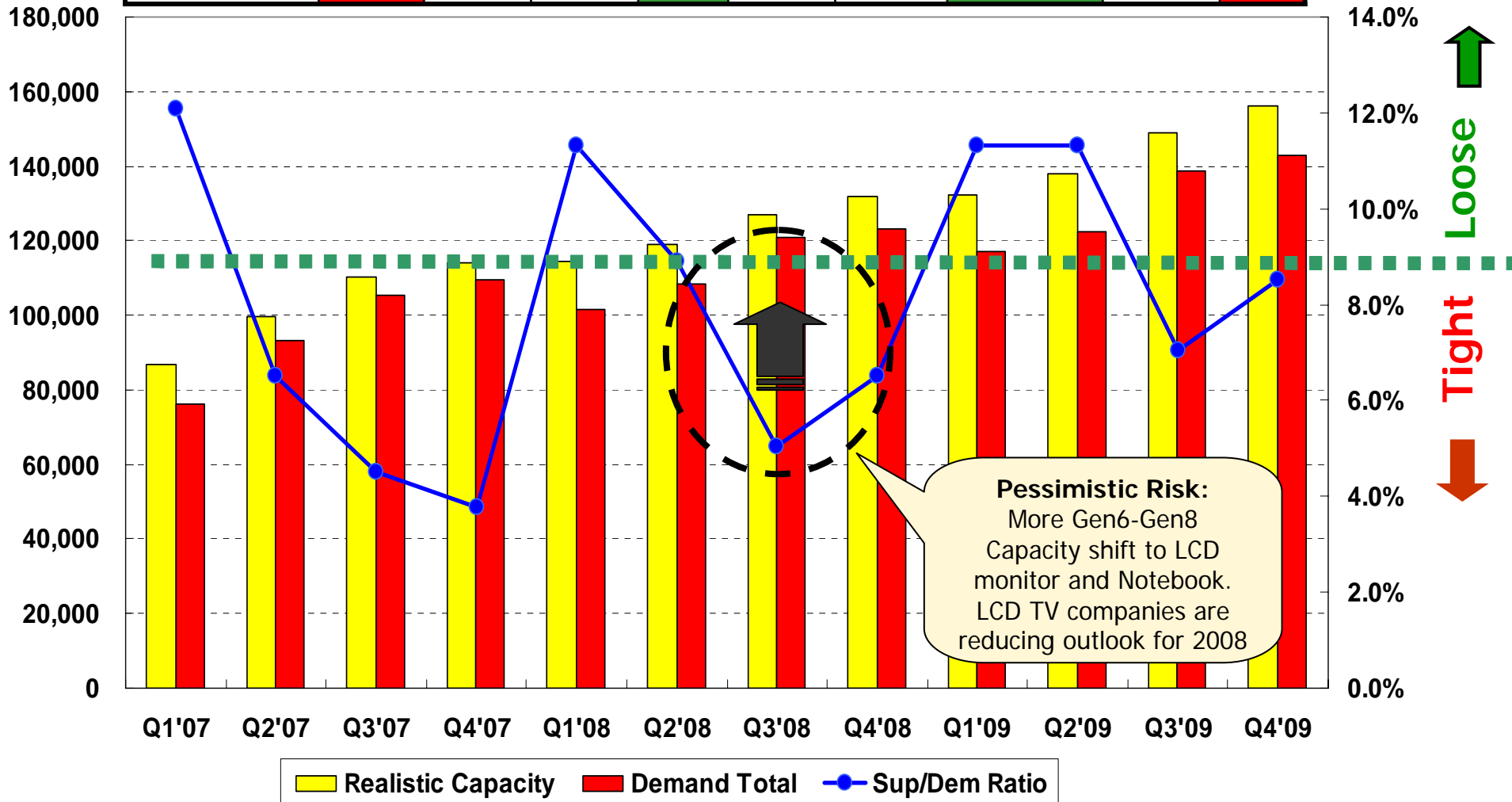
Outline

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- Cost & Forecast ...LCD TV, PDP TV
- LCD TV Panel Supply-Demand



2008 Large Size TFT LCD – A Good But **Tricky** Year

NB/MNT	Tight	Tight	Loose	Tight	Tight → Balance	Balance	Loose	Tight	Tight
LCD TV	Tight	Balance	Balance	Loose	Balance	Balance	Loose	Balance	Tight



Source: Q1'08 DisplaySearch Supply-Demand & Capital Spending Report

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2008 LCD TV Panel Target v.s. Set Target

Size	Panel Shipment Target	LCD TV Set Makers' Target	Panel/Set
15"	2,510	1,449	173%
16"W	1,112	766	145%
17"W	458	63	724%
19"/19"W	10,605	8,425	126%
20"/20"W	3,962	4,872	81%
22"W	4,600	1,776	259%
23"W	201	1,067	19%
26"W	13,099	10,469	125%
32"W	42,405	35,689	119%
37"W	12,564	9,986	126%
40"HD	4,525	4,007	113%
40"FHD	7,547	5,369	141%
42"HD	4,453	4,892	91%
42"FHD	7,657	5,920	129%
46"W	5,873	5,216	113%
47"W	2,578	1,921	134%
52"FHD	2,816	2,184	129%
55"+	130	126	103%
Total	127,095	104,198	122%

LCD Monitor Panels

32" is still the focus of most LCD TV brands and the demand is still strong.

40"/42"/47" will be in larger oversupply in 2008.